



MTRN2060

Introduction to Mechatronics

Session 2, In person-scheduled-weekday, North Ryde 2026

School of Engineering

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Disclaimer

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General Information

Unit convenor and teaching staff

Unit convenor, lecturer

Binesh Puthen Veetil

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9WW 290

Fri 12pm-1pm

Credit points

10

Prerequisites

((PHYS1010 and PHYS1020) or (PHYS1520 and (MECH1001 or CIVL1001)) AND (MATH1020 or MATH1025) AND COMP1000

Corequisites

Co-badged status

Unit description

This unit introduces the basic components of mechatronic systems including sensors, actuators, decision-making components and the electronics that connect them. It details how these individual components work, and how they are integrated into simple systems. This process empowers students to be engineers and makers who see how instrumentation and automation surround us and enable modern life. The unit builds on foundations in electricity, mechanics, and programming and asks participants to learn how sensors and actuators work (physics), how they interact (signals), and how they behave (system response). The unit is essential for further study in the field of mechatronic engineering, where the simple systems examined and experimented with here are built into complex automated electromechanical machines.

Learning in this unit enhances student understanding of global challenges identified by the United Nations Sustainable Development Goals ([UNSDGs](#)) Quality Education; Industry, Innovation and Infrastructure

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

Learning Outcomes

On successful completion of this unit, you will be able to:

ULO1: Demonstrate theoretical and practical understanding of a modern micro-controller

ULO2: Demonstrate theoretical and practical use of a variety of sensors, actuators, and appropriate interfacing electronics.

ULO3: Demonstrate practical use and theoretical understanding of electromechanics and small DC motors.

ULO4: Apply creativity and initiative in building self-directed mechatronic systems.

ULO5: Demonstrate a qualitative understanding of system response, including 2nd order systems.

General Assessment Information

Requirements to pass the unit: To pass this unit a student must obtain a mark of 50 or more for the unit (i.e. obtain a passing grade P/ CR/ D/ HD). For further details about grading, please refer below in the policies and procedures section. There are no hurdles.

Attendance and participation: We strongly encourage all students to actively participate in all learning activities. Regular engagement is crucial for your success in this unit, as these activities provide opportunities to deepen your understanding of the material, collaborate with peers, and receive valuable feedback from instructors, to assist in completing the unit assessments. Your active participation not only enhances your own learning experience but also contributes to a vibrant and dynamic learning environment for everyone.

On-campus activities commence in week 1. But there will be **NO PRACTICAL CLASSES in week 1**. If you are unable to return to campus for the start of session, contact the unit convenor immediately.

Late Assessment Submission: Late assessments are not accepted in this unit unless a [Special Consideration](#) has been submitted and approved.

Special Consideration: The [Special Consideration Policy](#) aims to support students who have been impacted by short-term circumstances or events that are serious, unavoidable and significantly disruptive, and which may affect their performance in assessment. If you experience circumstances or events that affect your ability to complete the assessments in this unit on time, please inform the convenor and submit a Special Consideration request through <https://connect.mq.edu.au>.

Assessment Tasks

Name	Weighting	Hurdle	Due	Groupwork/Individual	Short Extension	AI Approach
<u>Problem set</u>	45%	No	15/10/2026	Individual	Yes	Open
<u>Self Directed Practical Project</u>	10%	No	03/11/2026	Individual	Yes	Open

Name	Weighting	Hurdle	Due	Groupwork/Individual	Short Extension	AI Approach
<u>Practical Tasks</u>	45%	No	27/10/2026	Individual	No	Observed

Problem set

Assessment Type ¹: Problem-based task

Indicative Time on Task ²: 12 hours

Due: **15/10/2026**

Weighting: **45%**

Groupwork/Individual: Individual

Short extension ³: Yes

AI Approach: Open

The problem set is designed to test the knowledge and skills you have developed on the topics (modules) covered in the unit. It is an invigilated assessment. It includes questions ranging from fundamental to more challenging, allowing you to demonstrate your newly acquired skills and knowledge. You will complete and submit the problem set towards the end of the semester before the due date specified in iLearn.

On successful completion you will be able to:

- Demonstrate theoretical and practical understanding of a modern micro-controller
- Demonstrate theoretical and practical use of a variety of sensors, actuators, and appropriate interfacing electronics.
- Demonstrate practical use and theoretical understanding of electromechanics and small DC motors.
- Demonstrate a qualitative understanding of system response, including 2nd order systems.

Self Directed Practical Project

Assessment Type ¹: Practice-based task

Indicative Time on Task ²: 12 hours

Due: **03/11/2026**

Weighting: **10%**

Groupwork/Individual: Individual

Short extension ³: Yes

AI Approach: Open

In the final two weeks of term you will complete and present a mechatronic project of your own design. The rubric for this task will be posted on iLearn.

On successful completion you will be able to:

- Demonstrate theoretical and practical understanding of a modern micro-controller
- Demonstrate theoretical and practical use of a variety of sensors, actuators, and appropriate interfacing electronics.
- Apply creativity and initiative in building self-directed mechatronic systems.

Practical Tasks

Assessment Type ¹: Portfolio

Indicative Time on Task ²: 24 hours

Due: **27/10/2026**

Weighting: **45%**

Groupwork/Individual: Individual

Short extension ³: No

AI Approach: Observed

You will complete small projects during practical sessions, guided by worksheets. You will maintain a logbook which will be submitted for marking towards the end of the semester, by the due date specified in iLearn.

On successful completion you will be able to:

- Demonstrate theoretical and practical understanding of a modern micro-controller
- Demonstrate theoretical and practical use of a variety of sensors, actuators, and appropriate interfacing electronics.
- Demonstrate practical use and theoretical understanding of electromechanics and small DC motors.
- Demonstrate a qualitative understanding of system response, including 2nd order systems.

¹ If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- [Academic Success](#) for academic skills support.

² Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation.

³ An automatic short extension is available for some assessments. Apply through the [Service Connect Portal](#).

Delivery and Resources

Week1 classes: On-campus activities (workshops) commence in week 1. if you are unable to

return to campus for the start of session, contact the unit convenor immediately. There will be **NO PRACTICAL CLASSES in week 1**.

Method of Communication: We will communicate with you via your university email and through announcements on iLearn. Queries to convenors can either be placed on the iLearn discussion board or sent to the unit convenor via the contact email on iLearn.

Textbook: Introduction to Mechatronics and Measurement Systems by Alciatore and Histand. (3rd or 4th Edition is suitable)

Equipment: You must have your own Arduino electronics kit (as supplied to you in ENGG1000). It must contain the following items: 1x arduino, 1x breadboard, 30x wires, 10x LEDs various color, 10x 330R resistor, 2x 10k Resistor, 1x turnpot, 2x pushbuttons, 1x buzzer. We will supply some extra components at no charge.

Textbook homepage: <http://mechatronics.colostate.edu/>

Technology and Software: We will use Arduino microcontrollers for all practical sessions. You will also be expected to analyse data using matlab, MS Excel or some other program of your choice.

Unit Schedule

Refer to iLearn and lecture notes for the unit schedule.

Also note, on-campus workshop will start in week 1. There will be no practical classes in week 1.

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](https://policies.smq.edu.au) (<https://policies.smq.edu.au>). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- [Academic Appeals Policy](#)
- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)
- [Fitness to Practice Procedure](#)
- [Assessment Procedure](#)
- [Complaints Resolution Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#)

Students seeking more policy resources can visit [Student Policies](https://students.smq.edu.au/support/study/policies) (<https://students.smq.edu.au/support/study/policies>). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

To find other policies relating to Teaching and Learning, visit [Policy Central](https://policies.smq.edu.au) (<https://policies.smq.edu.au>) and use the [search tool](#).

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/admin/other-resources/student-conduct>

Results

Results published on platform other than [eStudent](#), (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit connect.mq.edu.au or if you are a Global MBA student contact globalmba.support@mq.edu.au

Academic Integrity

At Macquarie, we believe [academic integrity](#) – honesty, respect, trust, responsibility, fairness and courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a range of resources and services to help you reach your potential, including free [online writing and maths support](#), [academic skills development](#) and [wellbeing consultations](#).

Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

Academic Success

[Academic Success](#) provides resources to develop your English language proficiency, academic writing, and communication skills.

- [Ask a Study Coach](#)
- [Access StudyWISE](#)
- [Upload an assignment to Studiosity](#)
- [Complete the Academic Integrity Module](#)

The Library provides online and face to face support to help you find and use relevant information resources.

- [Subject and Research Guides](#)
- [Ask a Librarian](#)

Student Services and Support

Macquarie University offers a range of [Student Support Services](#) including:

- [IT Support](#)
- [Accessibility and disability support](#) with study
- Mental health [support](#)

- [Safety support](#) to respond to bullying, harassment, sexual harassment and sexual assault
- [Social support including information about finances, tenancy and legal issues](#)
- [Student Advocacy](#) provides independent advice on MQ policies, procedures, and processes

Student Enquiries

Got a question? Ask us via the [Service Connect Portal](#), or contact [Service Connect](#).

IT Help

For help with University computer systems and technology, visit <https://students.mq.edu.au/support/technology/service-desk>.

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.

Changes from Previous Offering

Student feedback from the previous offering of this unit was positive overall, with students pleased with the clarity around assessment requirements and the level of support from teaching staff. As such, no change to the delivery of the unit is planned, however we will continue to strive to improve the level of support and the level of student engagement.

Unit information based on version 2026.02 of the [Handbook](#)